



United States Department
of Agriculture



Natural Resources
Conservation Service

Lakewood, Colorado

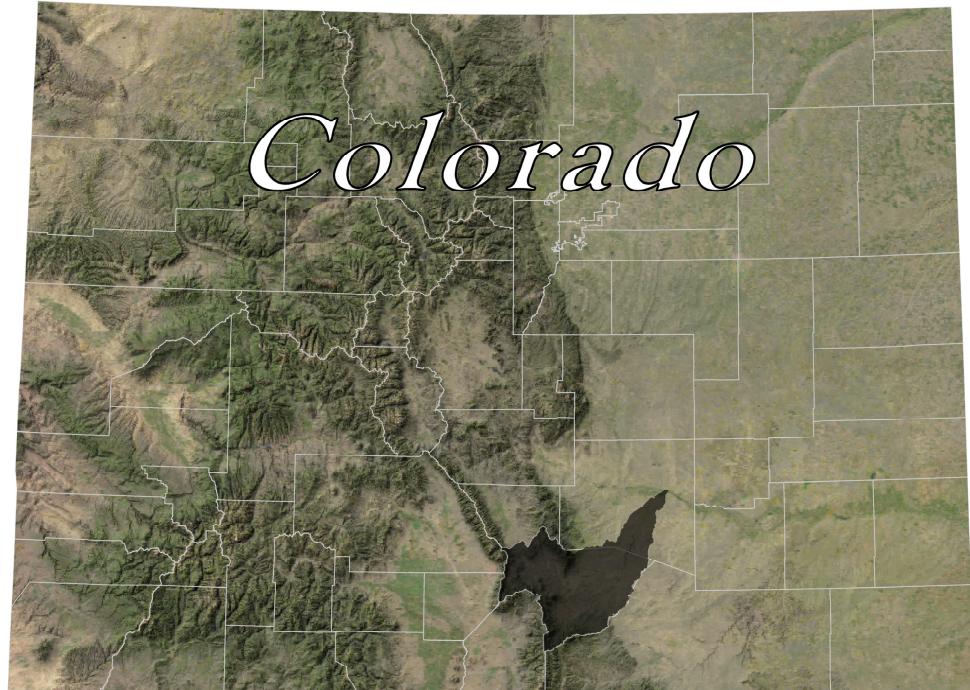
Huerfano Watershed

Hydrologic Unit Code 11020006

RWA 11020006

January 2008

Rapid Assessment



Satellite Imagery: ArcIMS Server - Geographic Network Services hosted by ESRI

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Introduction

Background Information

The Natural Resources Conservation Service (NRCS) is encouraging the development of rapid watershed assessments in order to increase the speed and efficiency generating information to guide conservation implementation, as well as the speed and efficiency of putting it into the hands of local decision makers.

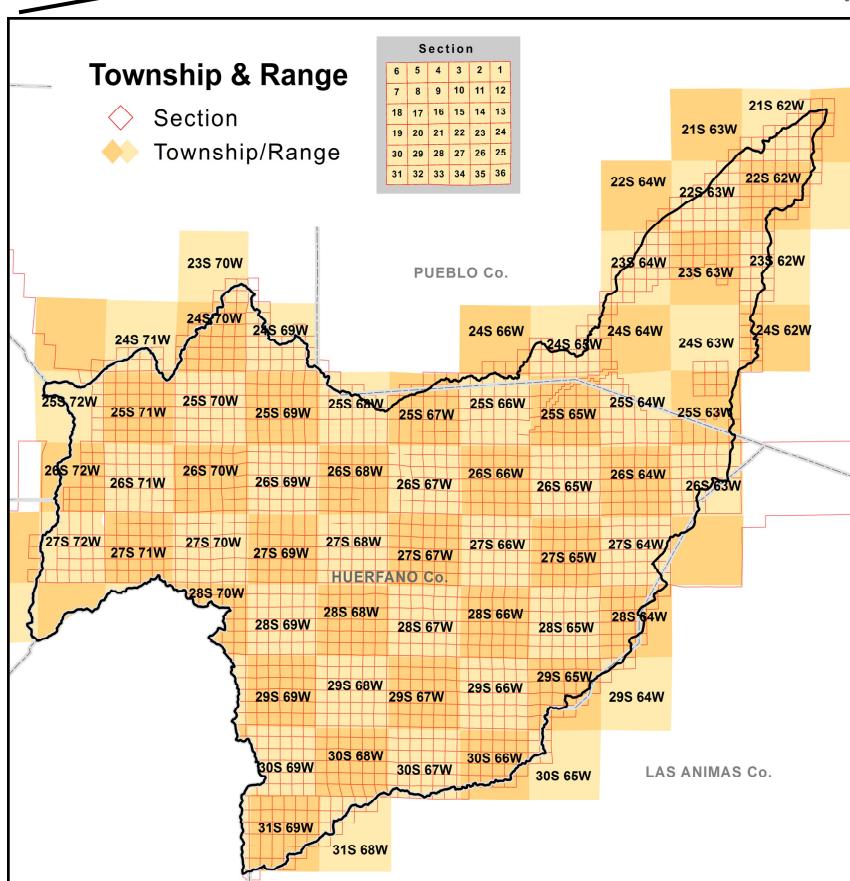
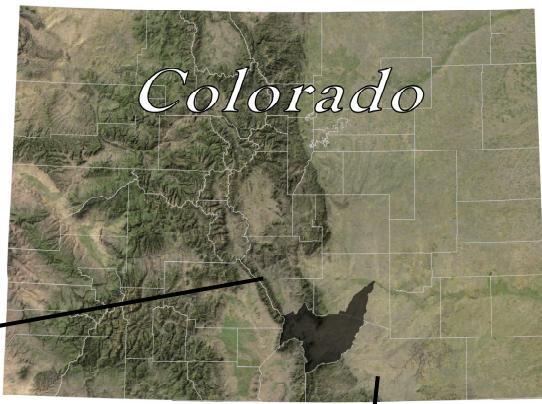
Rapid watershed assessments provide initial estimates of where conservation investments would best address the concerns of landowners, conservation districts, and other community organizations and stakeholders. These assessments help land-owners and local leaders set priorities and determine the best actions to achieve their goals.

Benefits of these Activities

While rapid assessments provide less detail and analysis than full-blown studies and plans, they do provide the benefits of NRCS locally-led planning in less time and at a reduced cost. The benefits include:

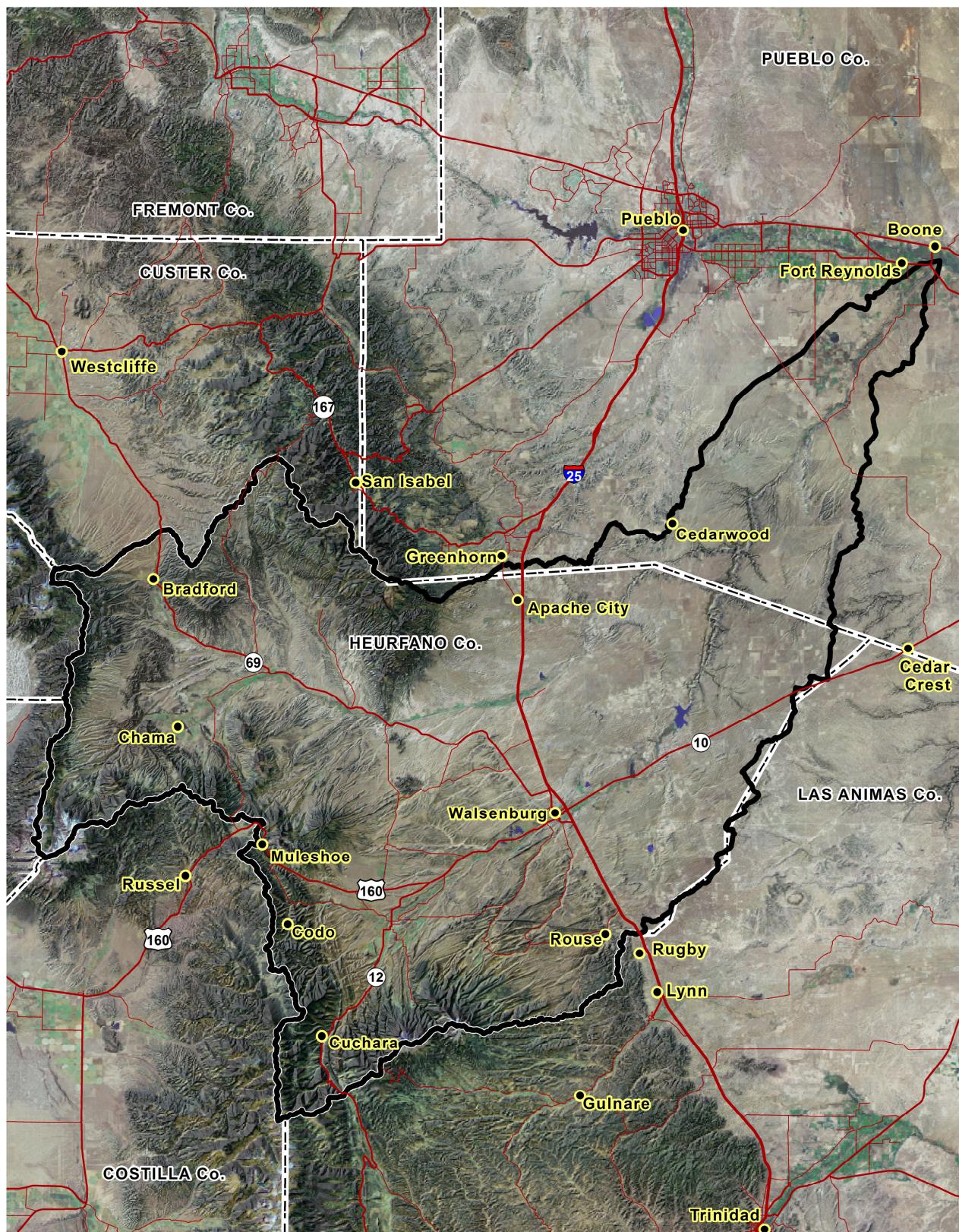
- Quick and inexpensive tools for setting priorities and taking action
- Providing a level of detail that is sufficient for identifying actions that can be taken with no further watershed-level studies or analyses
- Actions to be taken may require further Federal or State permits or ESA or NEPA analysis but these activities are part of standard requirements for use of best management practices (BMPs) and conservation systems
- Identifying where further detailed analyses or watershed studies are needed
- Plans address multiple objectives and concerns of landowners and communities
- Plans are based on established partnerships at the local and state levels
- Plans enable landowners and communities to decide on the best mix of NRCS programs that will meet their goals
- Plans include the full array of conservation program tools (i.e. cost-share practices, easements, technical assistance)

Rapid Watershed Assessments provide information that helps land-owners and local leaders set conservation priorities.

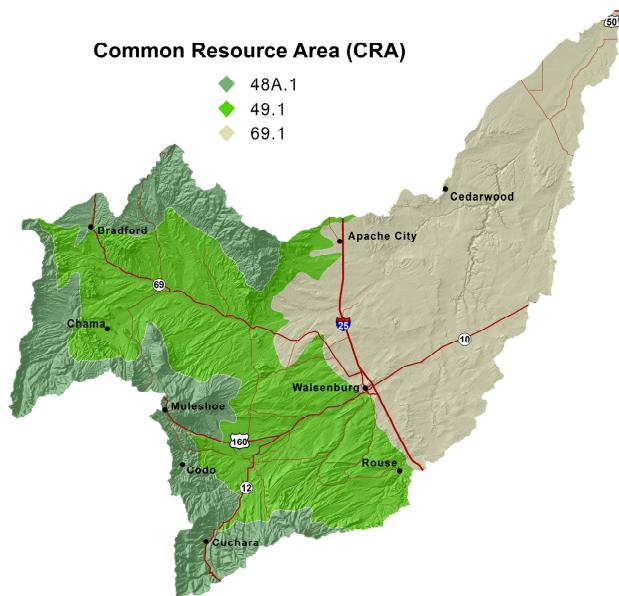


County	County Acres	County Acres in Huerfano Watershed	% of County in the Watershed	% of Watershed in the County
Huerfano	1,018,970	1,007,651	98.89%	84.81%
Las Animas	3,054,953	1,884	0.06%	0.16%
Pueblo	1,533,605	178,297	11.6%	15.01%

Huerfano Watershed - 11020006

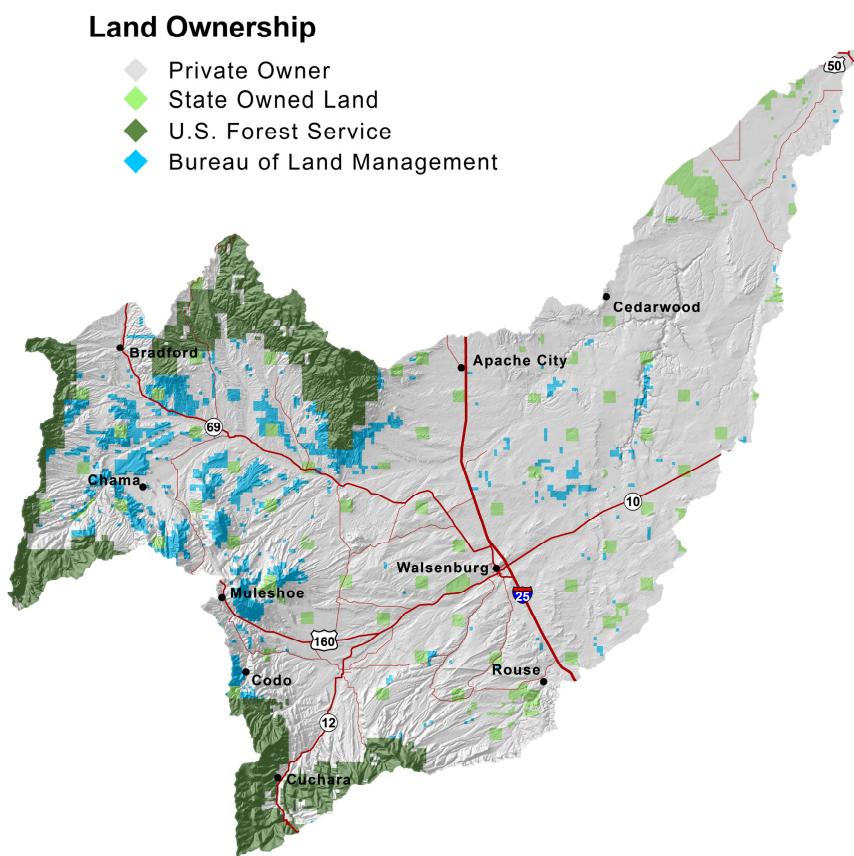
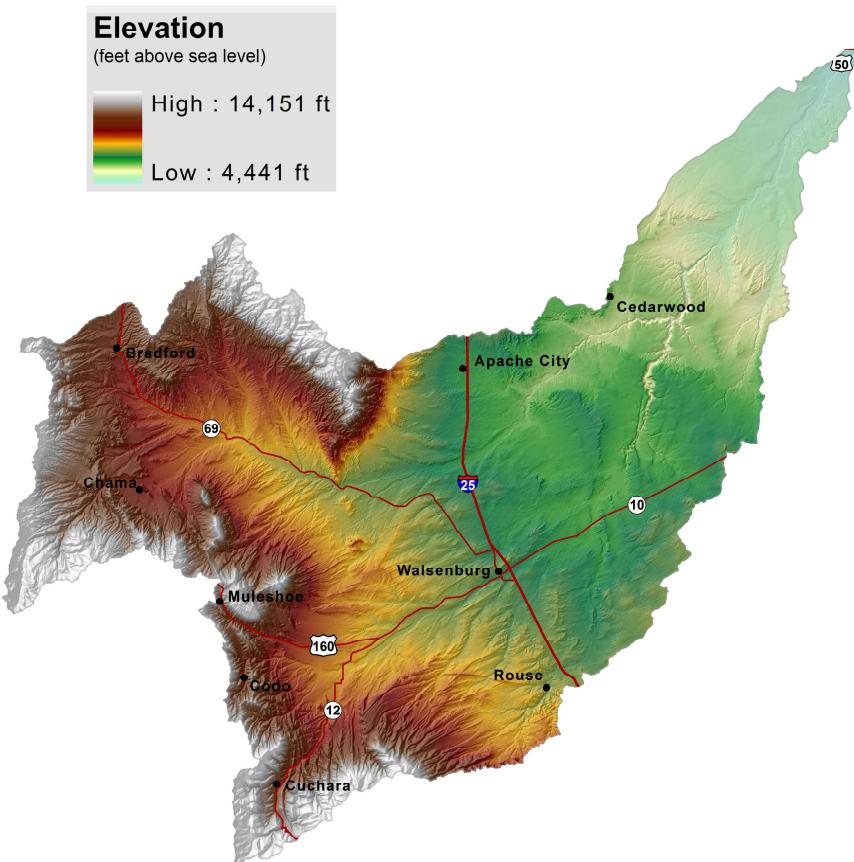


Satellite Imagery: ArcIMS Server - Geography Network Services hosted by ESRI



Common Resource Areas (CRA): Geographical areas where resource concerns, problems, and treatment needs are similar. Landscape conditions, soil, climate, human considerations, and other natural resource information are used to determine the geographical boundaries of the common resource area.

CMLRA	CRA	CRA NAME	CRA DESCRIPTION
48A	48A.1	Southern Rocky Mountains - High Mountains and Valleys	This area is best characterized by steep, high mountain ranges and associated mountain valleys. The temperature regimes are mostly frigid and cryic; moisture regimes are mainly ustic and udic. Vegetation is sagebrush-grass at low elevations, and with increasing elevation ranges from coniferous forest to alpine tundra. Elevations range from 6,500 to 14,400 feet.
49	49.1	Southern Rocky Mountain Foothills	This area is generally a transition between the Great Plains and the Southern Rocky Mountains. The temperature regime is mesic or frigid, and moisture regime is ustic. Characteristic native vegetation ranges from grasslands and shrubs to ponderosa pine and Rocky Mountain Douglas fir forest.
69	69.1	Upper Arkansas Valley Rolling Plains	The Upper Arkansas Valley Rolling Plains CRA is broad, undulating to rolling shale plains occurring along the upper tributaries of the Arkansas River. Local relief reaches 200 feet. Soils are shallow to deep and formed in loess, aeolian, alluvial and outwash materials. Pre-settlement vegetation was short grass prairies and pinyon and juniper stands on the stony and rocky soils. Nearly all of this area is in rangeland. Small areas of irrigated cropland occur along the floodplains and terraces.



Vegetation

- | | |
|----------------------------------|----------------------------------|
| ◆ No Data | ◆ Sagebrush/Gambel Oak Mix |
| ◆ Alpine Grass Dominated | ◆ Sagebrush/Mesic Mtn Shrub Mix |
| ◆ Alpine Grass/Forb Mix | ◆ Saltbush Community |
| ◆ Alpine Meadow | ◆ Sedge |
| ◆ Aspen | ◆ Shrub Riparian |
| ◆ Aspen/Mesic Mountain Shrub Mix | ◆ Shrub/Brush Rangeland |
| ◆ Barren Land | ◆ Shrub/Grass/Forb Mix |
| ◆ Bristlecone Pine | ◆ Sparse Grass (Blowouts) |
| ◆ Commercial | ◆ Sparse Juniper/Shrub/Rock Mix |
| ◆ Cottonwood | ◆ Sparse PJ/Shrub/Rock Mix |
| ◆ Douglas Fir | ◆ Spruce/Fir/Aspen Mix |
| ◆ Douglas Fir/Aspen Mix | ◆ Spruce/Fir/Lodgepole/Aspen Mix |
| ◆ Dryland Ag | ◆ SubAlpine Shrub Community |
| ◆ Englemann Spruce/Fir Mix | ◆ Subalpine Grass/Forb Mix |
| ◆ Forested Riparian | ◆ Talus Slopes & Rock Outcrops |
| ◆ Gambel Oak | ◆ Upland Willow/Shrub Mix |
| ◆ Grass Dominated | ◆ Water |
| ◆ Grass/Forb Mix | ◆ Willow |
| ◆ Grass/Misc. Cactus Mix | ◆ Xeric Mountain Shrub Mix |
| ◆ Greasewood | |
| ◆ Herbaceous Riparian | |
| ◆ Irrigated Ag | |
| ◆ Juniper | |
| ◆ Limber Pine | |
| ◆ Lodgepole Pine | |
| ◆ Mesic Mountain Shrub Mix | |
| ◆ P. Pine/Gambel Oak Mix | |
| ◆ PJ-Mtn Shrub Mix | |
| ◆ PJ-Oak Mix | |
| ◆ Pinon-Juniper | |
| ◆ Ponderosa Pine | |
| ◆ Ponderosa Pine/Aspen Mix | |
| ◆ Ponderosa Pine/Douglas Fir Mix | |
| ◆ Rabbitbrush/Grass Mix | |
| ◆ Residential | |
| ◆ Rock | |
| ◆ Sagebrush Community | |

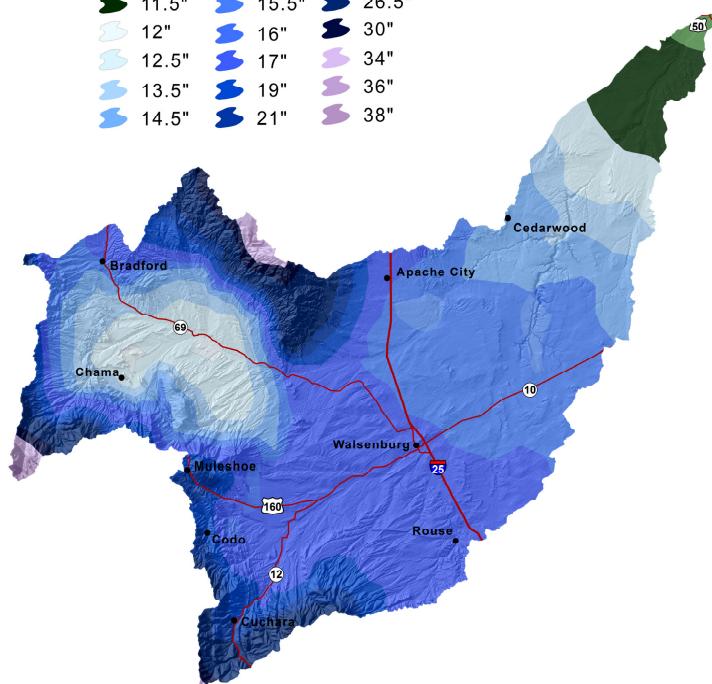
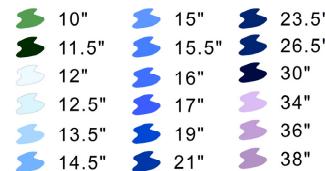


Land Use	Total Acreage	Vegetation	Acreage
Cropland	33,322	Dryland Ag	1,183
		Irrigated Ag	32,139
Rangeland/Grassland	925,199	Alpine Grass Dominated	224
		Alpine Grass/Forb Mix	5,603
		Alpine Meadow	270
		Gambel Oak	74,923
		Grass Dominated	83,919
		Grass/Forb Mix	233,575
		Grass/Misc. Cactus Mix	111,415
		Greasewood	2,057
		Mesic Mtn. Shrub Mix	15
		PJ/Mtn. Shrub Mix	11,897
		Pinon Juniper	103,974
		Rabbitbrush/Grass Mix	27,617
		Sagebrush Community	45
		Sagebrush/Gambel Oak Mix	<1
		Sagebrush/Mesic Mtn. Shrub Mix	<1
		Saltbrush Community	3,351
		Sedge	<1
		Shrub/Brush Rangeland	2,173
		Shrub/Grass/Forb Mix	199,395
		Sparse Grass (Blowouts)	96
		Sparse Juniper/Shrub/Rock Mix	21
		Sparse PJ/Shrub/Rock Mix	55,472
		Subalpine Shrub Community	173
		Subalpine Grass/Forb Mix	8,016
		Upland Willow/Shrub Mix	946
		Xeric Mtn. Shrub Mix	19
Forest	213,318	Aspen	23,693
		Aspen/Mesic Mtn. Shrub Mix	1,870
		Bristlecone Pine	12
		Cottonwood	6,167
		Douglas Fir	19,227
		Douglas Fir/Aspen Mix	10,127
		Englemann Spruce/Fir Mix	49,780
		Juniper	38
		Limber Pine	171
		Lodgepole Pine	1,166
		Pinon Pine/Gambel Oak Mix	23,029
		PJ/Oak Mix	6,714
		Ponderosa Pine	41,993
		Ponderosa Pine/Aspen Mix	4,770
		Ponderosa Pine/Douglas Fir Mix	12,692
		Spruce/Fir/Aspen Mix	11,863
		Spruce/Fir/Lodgepole/Aspen Mix	<1
		Willow	5
Riparian	4,223	Forested Riparian	1,703
		Herbaceous Riparian	2,039
		Shrub Riparian	481
Water	3,017	Water	3,017
Other	8,914	Barren Land	1,091
		Commercial	240
		Residential	648
		Rock	6,769
		Talus Slopes & Rock Outcrops	166
Total Watershed Acres			1,187,993

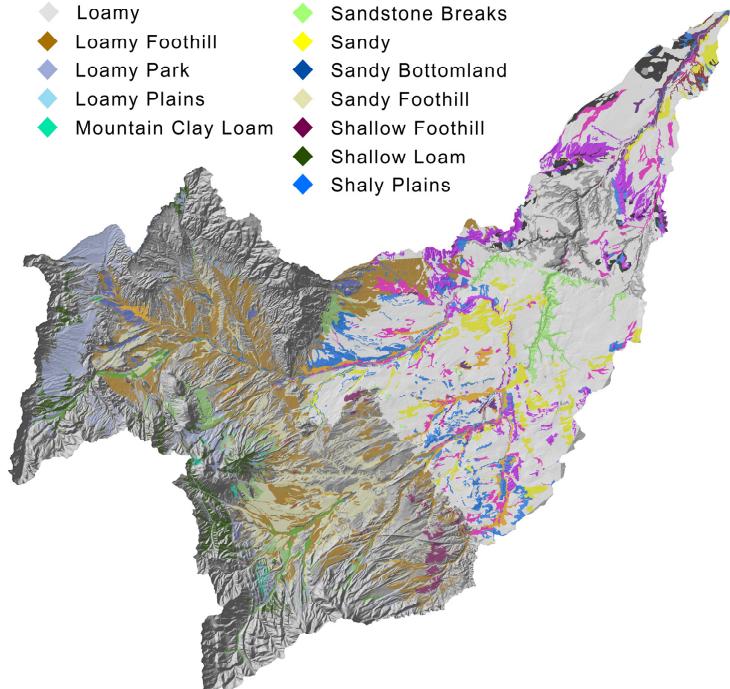
Precipitation

Droughts are regular visitors to the watershed as with the rest of Colorado. Statewide, in the 1900's alone, four prolonged dry spells occurred. There was one in the 1910s. Another, in the '30s, caused the dust-bowl period. The second worst drought on record in the state occurred in the mid-50s. A series of hot, dry summers following a period of scant mountain snowpack created water shortages. The fourth drought hit parts of Colorado in the late 1970s. In this century, the most severe drought since 1723 hit the state in 2002. Prior to the 1700's, researchers looking at tree ring records have found evidence of even more severe droughts, some lasting many years. Rainfall occurs as frontal storms in the spring and early summer and high intensity, convective thunderstorms in late summer. Maximum precipitation is from mid spring through late autumn. Precipitation in winter is snow. The average annual temperature is from 45 to 55 degrees F. The frost free period averages 162 days but ranges from 133 to 191 days.

Precipitation
(Average Annual Rainfall)



Soil: Ecological Site Names



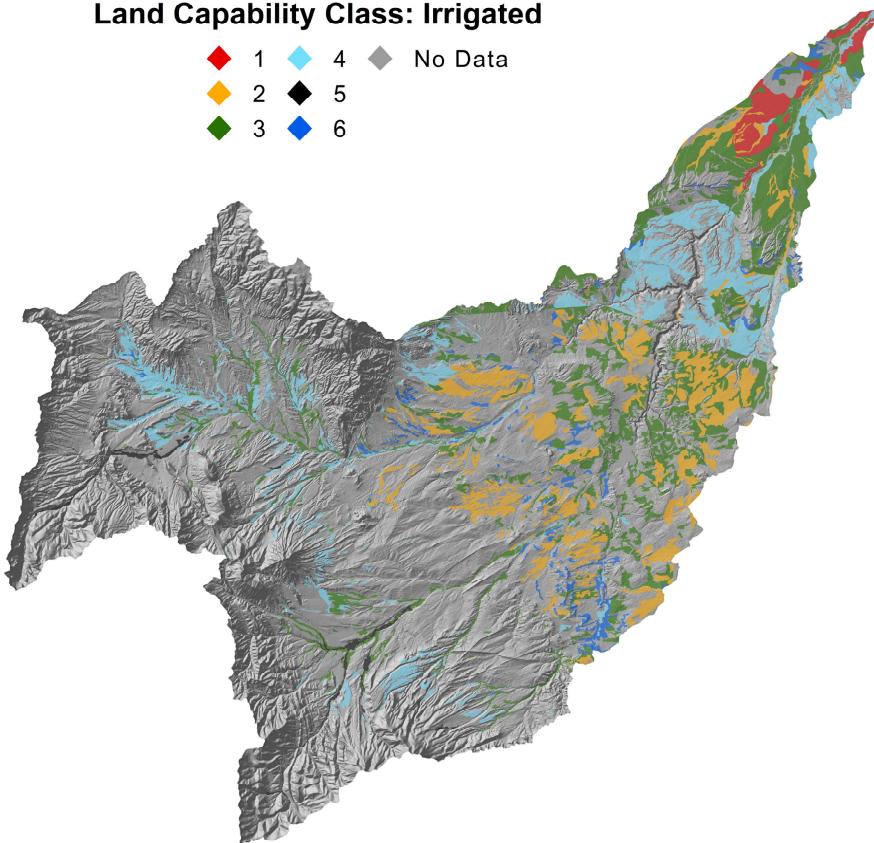
Ecological Sites

The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production.

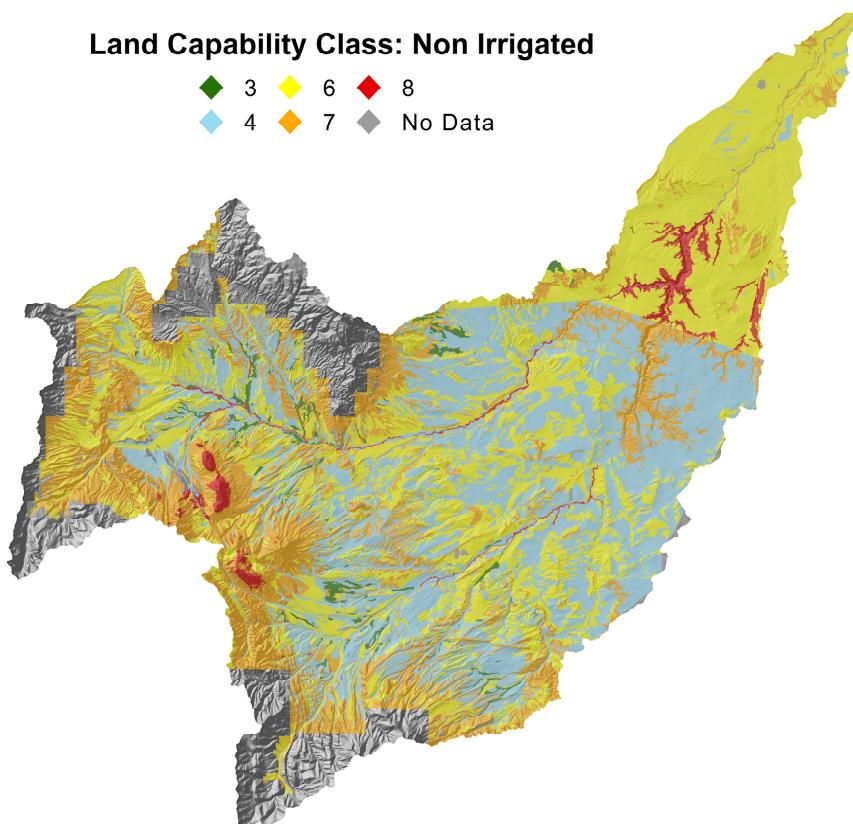
Ecological Site maps give an overall indication of the soils plant relationship in the area. More detailed descriptions of ecological sites are provided in the Field Office Technical Guide (FOTG). The FOTG is available in local offices of the Natural Resources Conservation Service (NRCS) and online at <http://www.nrcs.usda.gov/technical/efotg/>.

Land Capability Class: Irrigated

- ◆ 1 ◆ 4 ◆ No Data
- ◆ 2 ◆ 5
- ◆ 3 ◆ 6

**Land Capability Class: Non Irrigated**

- ◆ 3 ◆ 6 ◆ 8
- ◆ 4 ◆ 7 ◆ No Data

**Land Capability Classification**

Class 1 - soils have few limitations that restrict their use.

Class 2 - soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class 3 - soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class 4 - soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class 5 - soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

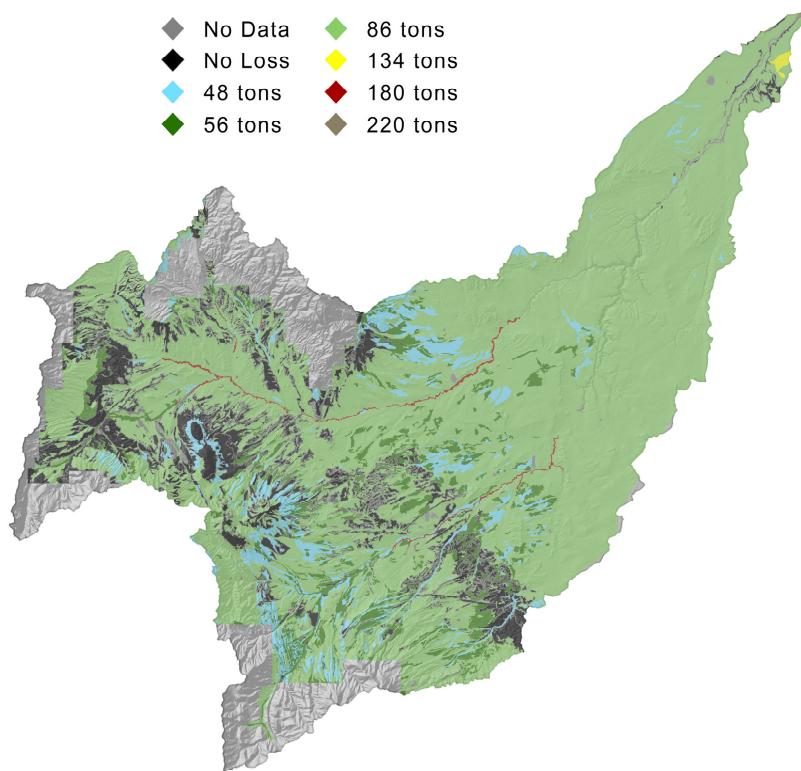
Class 6 - soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 - soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 - soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or aesthetic purposes.

Wind Erodibility Index (WEI) (Tons/Acre/Year)

- ◆ No Data
- ◆ No Loss
- ◆ 48 tons
- ◆ 56 tons
- ◆ 86 tons
- ◆ 134 tons
- ◆ 180 tons
- ◆ 220 tons



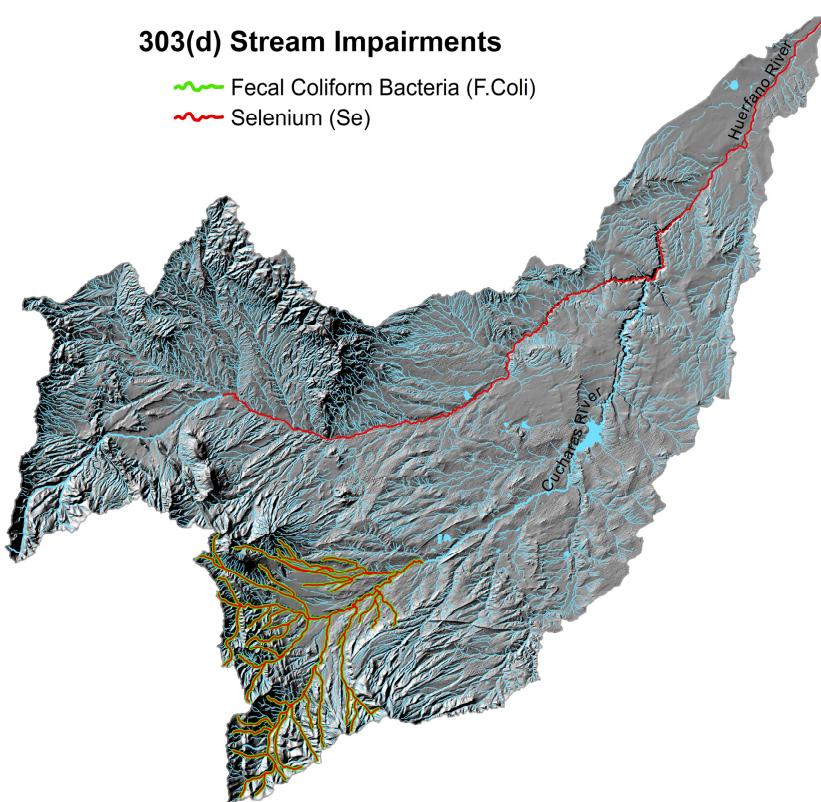
The Wind Erodibility Index (WEI), is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion if it is assumed there is no vegetative cover or management.

Soils with an erodibility index equal to or greater than 8 are considered highly erodible.

As shown on the Wind Erodibility Index map below, most agricultural soils in the Huerfano Watershed are highly erodible.

303(d) Stream Impairments

- ◆ Fecal Coliform Bacteria (F.Coli)
- ◆ Selenium (Se)



Stream Impairments

Section 303(d) of the Clean Water Act requires states to identify and list all water bodies where state water quality standards are not being met.

Thereafter, TMDLs compromising quantitative objectives and strategies have been or will be developed for these impaired waters within the watershed in order to achieve their water quality standards.

Impairment Definitions

Selenium: A naturally occurring metal in marine shale that serves as a micronutrient. Excessive amounts impair aquatic life and bioaccumulation up the food chain occurs causing toxicity to birds, mammals, and humans.

Fecal Coliform Bacteria: bacteria that are associated with human or animal wastes. They usually live in human or animal intestinal tracts, and their presence in drinking water is a strong indication of recent sewage or animal waste contamination

State and Federal Threatened, Endangered, and Candidate Species and Species of Special Concern in Huerfano Watershed

Common Name	Scientific Name	Class	State Status/Federal Status	Comments
Arkansas Darter	<i>Etheostoma cragini</i>	Fish	Threatened/Candidate	May occur in the watershed
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Birds	Threatened/None	Winters in the watershed
Black-footed Ferret	<i>Mustela nigripes</i>	Mammals	Endangered/Endangered	No current records of occurrence
Black-tailed Prairie Dog	<i>Cynomys ludovicianus</i>	Mammals	Concern/None	Occurs in the watershed
Burrowing Owl	<i>Athene cunicularia</i>	Birds	Threatened/None	Occurs in the watershed
Canada Lynx	<i>Lynx canadensis</i>	Mammals	Endangered/Threatened	May occur in the watershed
Ferruginous Hawk	<i>Buteo regalis</i>	Birds	Concern/None	Occurs in the watershed
Greenback Cutthroat Trout	<i>Oncorhynchus clarki stomias</i>	Fish	Threatened/Threatened	May occur in the watershed
Flathead Chub	<i>Platygobio gracilis</i>	Fish	Concern/None	Occurs in the watershed
Long-Billed Curlew	<i>Numenius americanus</i>	Birds	Concern/None	May occur in the watershed
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	Birds	Threatened/Threatened	May occur in the watershed
Mountain Plover	<i>Charadrius montanus</i>	Birds	Concern/None	Occurs in the watershed
Northern Leopard Frog	<i>Rana pipiens</i>	Amphibians	Concern/None	May occur in the watershed
Plains Leopard Frog	<i>Rana blairi</i>	Amphibians	Concern/None	Occurs in the watershed
Suckermouth Minnow	<i>Phenacobius mirabilis</i>	Fish	Endangered/None	May occur in Arkansas River near mouth of watershed
Swift Fox	<i>Vulpes velox</i>	Mammals	Concern/None	Occurs in the watershed
Townsend's big-eared bat (pale ssp)	<i>Corynorhinus townsendii pallescens</i>	Mammals	Concern/None	May occur in the watershed
Triloid checkered whiptail	<i>Cnemidophorus neotesselatus</i>	Reptiles	Concern/None	Occurs in the watershed

The diverse terrestrial habitat types in this watershed range from shortgrass prairie to foothills shrublands to coniferous forest. Wildlife species found in this watershed are equally diverse. Species such as mountain plover, black-tailed prairie dog, and swift fox are adapted to the scarce water found on shortgrass prairie. Seasonal streams with associated riparian areas, water supply reservoirs, and stock ponds provide aquatic habitats in the watershed. Higher in the watershed, in the shrub and forest habitats, species such as elk, Canada lynx, and Mexican spotted owl may be found. Economically important wildlife species that occur in the watershed include black bullhead, green sunfish, trout, pronghorn (antelope), mule and white-tailed deer, elk, wild turkey, mourning dove, and scaled quail. Pheasant and bobwhite quail are found near the mouth of the watershed.

Social Data

	Huerfano	Las Animas	Pueblo
Demographics (US Census, American Factfinder)			
Total population	7,862	15,207	147,187
Male	4,269	7,441	71,711
Female	3,593	7,766	75,476
Median age (years)	41.7	40.9	36
White	6,365	12,566	120,922
Black or African American	216	60	2046
American Indian and Alaska Native	212	387	1647
Asian	31	57	1072
Native Hawaiian and Other Pacific Islander	6	30	202
Some other race	740	1525	16496
Hispanic or Latino (of any race)	2763	14816	58024
Economic Characteristics (US Census, American Factfinder)			
In labor force (population 16 years and over)	3,148	6,558	72,727
Median household income (dollars)	25,775	28,273	37,305
Median family income (dollars)	32,664	34,072	45,765
Per capita income (dollars)	15,242	16,829	19,668
Families below poverty level	269	572	na
Individuals below poverty level	1247	2573	na
County Agricultural Characteristics (Colorado Agricultural Census, county data tables)			
Farms (number)	292	567	801
Land in farms/ranches (acres)	608,002	2,304,766	774,352
Average size farm/ranch (acres)	2,082	4,065	967
Median size farm (acres)	680	1,000	175
Average age of farmer or rancher	58.6	57.6	55.5
Net cash return from ag sales (\$1,000)	1,116	1,798	5,788
Cattle and calves (number)	13,000	47,000	33,000

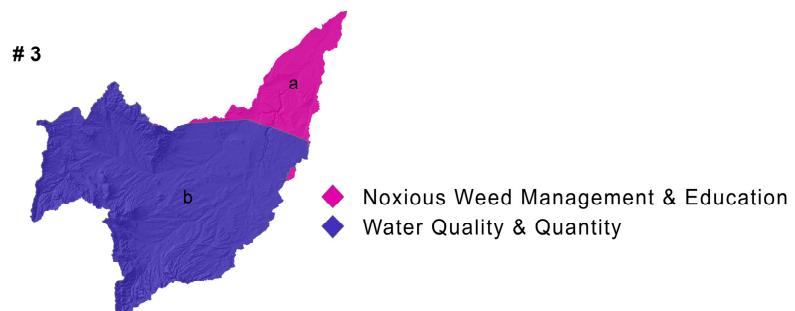
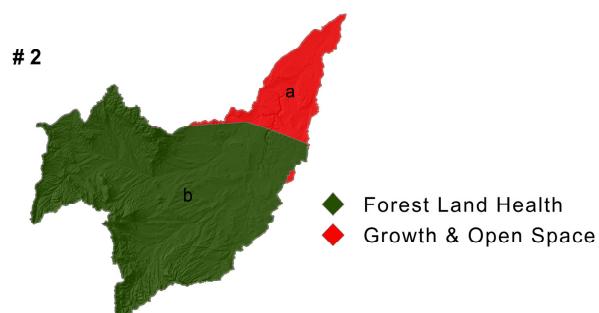
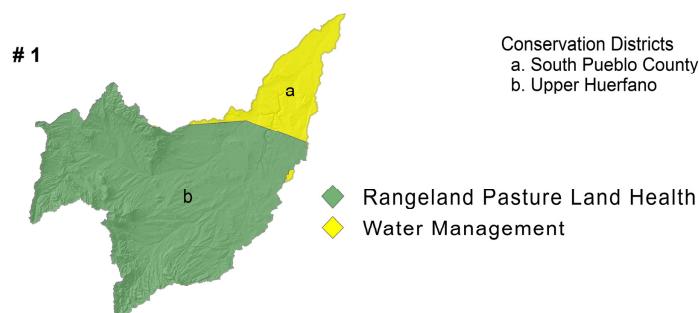
Huerfano Watershed Natural Resource Concerns

The Colorado Conservation Districts identified and prioritized the following resource concerns during facilitated public meetings and are included in their Long Range Plans. Issues with the highest scores are of greater concern:

	Water Quality	Water Quantity	Erosion	Invasive Species	Rangeland	Wildlife	Development	Forestry
South Pueblo County		5		3		2	4	
Upper Huerfano	3	3	1		5	2		4
Totals	3	8	1	3	5	4	4	4

Identified Long Range Resource Concerns

Top Three Concerns within Conservation Districts



Selected Conservation Application Data

	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total
Total Conservation Systems Planned (Acres)	289,789	335,816	Not Avail.	36,810	16,840	6,222	685,477
Total Conservation Systems Applied (Acres)	42,178	175,010	Not Avail.	76,012	18,880	27,388	339,468
Practices							
Prescribed Grazing	0	176,330	39,969	72,172	5,483	10,211	304,165
Upland Wildlife Habitat Management	105	28,387	320	14,164	0	0	42,976
Irrigation Water Management	731	912	56	0	115	230	2,044

Conservation Systems to Address Major Resource Concerns

Primary Resource Concern:	Rangeland Health			
Conservation System Description:	Prescribed Grazing—planned management that provides adequate recovery opportunity between grazing events and proper stocking of animals..			Based on Conservation System Guide Code: CO 69.1-GR-01-R-Grazing
Practices	Unit	Quantity	Cost/Unit (\$)	Estimated Cost (\$)
Prescribed Grazing				
Fence (382)	Ft.	21,120	0.6	12,672
Pest Management (595)	Ac.	300	4,500	4,500
Pipeline (516)	Ft.	15,000	2.40	36,000
Upland Wildlife Habitat Management (645)	Ac.	300	na	0
Watering Facility (614)	No.	2	410	820
Windbreak/Shelterbelt Establishment (380)	Ft.	1,000	.85	850
Costs to apply prescribed grazing per median sized ranch of 4,500 acres	No.	76	54,842	\$4,167,992
Subtotal: Rangeland costs				\$4,167,992

Conservation Systems to Address Major Resource Concerns (cont'd)

Primary Resource Concern: Water Quality/Quantity				
Conservation System Description:	Sprinkler irrigation system with IWM, Crop rotation, Mulch-till, Nutrient and Pest Mgt..			Reference Conservation System Guide Code: CO 69B.1-CR-Pivot-R-2
Practices	Unit	Quantity	Cost/Unit (\$)	Estimated Cost (\$)
Irrigation System, Sprinkler (442)	Ac	28,595	779	22,275,505
Irrigation Water Management (449)	Ac	28,595	5	142,975
Pest Management (595)	Ac	28,595	15	428,925
Subtotal Irrigated Crops: \$22,847,405				

General Effects, Impacts, and Costs of Application of Conservation Systems to address major resource concerns

Landuse	Resource	Measurable Effects	Non-measurable Effects	Estimated Costs (\$)
Rangeland	Plants		Improved plant condition, productivity, health and vigor. Grazing animals have adequate feed, forage, and shelter.	\$4,167,992
Irrigated Crops	Water	46 Ac-in/Ac/Yr	Nutrients and organics are stored, handled, disposed of, and managed so that surface water uses are not adversely affected.	\$22,847,405
Estimated Total Costs to Address Major Resource Concerns: \$27,015,397				

References Not Cited in Document

303(d) listed streams within Huerfano Watershed were created using data from Colorado Department of Public Health & Environments' Water Quality & Control Commission. Impaired streams are current as of April 30, 2006. For a list of all Colorado impaired streams, locations and priority ratings, visit <http://www.cdphe.state.co.us/regulations/wqccregs/100293wqlimitedsegtdmlds.pdf>.

Threatened and Endangered Species information was gathered using data from the Colorado Division of Wildlife (CDOW) Natural Diversity Information Source (NDIS).

Resource Concerns were identified using the Colorado Association of Conservation Districts' (CACD) long range (10 year) plans from the period of 1996-2000. For more information on Colorado's Conservation Districts, visit <http://www.cacd.us>.

Maps were generated using Soil Survey Geographic Database (SSURGO) tabular and spatial data. SSURGO data was downloaded for the following Colorado surveys:

Huerfano County Area (CO627) Published 01/12/2007

Vegetation data was generated using the Colorado Division of Wildlife's "Colorado Vegetation Classification Project" (CVCP) data. visit <http://ndis.nrel.colostate.edu/coveg>.

Common Resource Area (CRA), a subdivision of the Major Land Resource Area (MLRA), is a geographical area where resource concerns, problems, or treatment needs are similar. For more information on Common Resource Areas visit <http://soils.usda.gov/survey/geography/cra.html>.

Average Annual Precipitation data was developed through a partnership between the Natural Resources Conservation Service's (NRCS) National Water and Climate Center (NWCC), the National Cartography and Geospatial Center (NCGC), and the PRISM (the Parameter-elevation Regressions on Independent Slopes Model) group at Oregon State University (OSU), developers of PRISM. Mean annual precipitation maps were developed calculating averages of rainfall for the period of 1961-1990. For more information visit <http://www.ncgc.nrcs.usda.gov/products/datasets/climate/docs/fact-sheet.html> or <http://www.ocs.orst.edu/prism>.

Land Ownership (status, 2004 dataset) data was obtained from the Colorado Department of Transportation (CDOT). For more information, visit <http://www.dot.state.co.us>.

Relief & Elevation maps were created using the National Elevation Dataset (NED), 30m Digital Elevation Model (DEM) raster product assembled by the U.S. Geological Survey (USGS). The data was downloaded from the NRCS Geospatial Data Gateway at <http://datagateway.nrcs.usda.gov>.

Conservation Systems to address major resource concerns were extracted from the Conservation Systems Guides (CSG) compiled from local conservationists by the NRCS Ecological Sciences Section at the Lakewood State Office.

Effects and Impacts of application of conservation systems were extracted from Colorado eFOTG, Section III, Resource Quality Criteria, NRCS, Colorado, March 2005.

